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Unpacking the Parallel Effects of Parental Alcohol Misuse and Low Income on Risk of Supervisory Neglect

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Abstract

Although low income status and parent alcohol misuse are considered critical risk factors for child neglect, little is known about the mechanisms of this association. No known research has assessed the parallel effect of each on occurrence of child neglect. This study aimed to explore the direct and indirect effects of parent alcohol misuse and low family income on risk of supervisory neglect through mediating factors such as parent depressive symptoms and low social support.

The study used a sample of 2,990 parents of children under 13 years old who completed a listed telephone survey conducted in 50 mid-sized cities within California during 2009. We used a structural equation model to estimate the direct and indirect effects of parent alcohol misuse (defined as heavy drinking frequency) and low family income on supervisory neglect toward a focal child, as well as the indirect effect via parental depressive symptoms and low social support. Mediation analysis to capture direct, indirect, and total effects of these two independent variables were also conducted.

Results revealed a significant direct effect of low family income on likelihood of supervisory neglect. Low income also exhibited an indirect effect via increased depressive symptoms and low social support. Annual frequency of heavy drinking showed no direct effect on supervisory neglect likelihood, but an indirect effect was observed via increased depressive symptoms and decreased social support. Parent low income and high frequency heavy drinking likely increases risks for supervisory neglect through distinct pathways. Longitudinal research is needed to confirm the pathways identified within this study.

Keywords

Alcohol misuse; Low income; Supervisory neglect; Structural equation modeling

1 Introduction

Seventy-five percent of children identified as being maltreated in 2014 experienced some form of neglect (US DHHS, 2016). Supervisory neglect is consistently identified as the most

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common form of neglect in general population and child welfare samples (Hussey, Chang, & Kotch, 2006; Jonson-Reid, Drake, & Zhou, 2013; Mennen, Kim, San, & Trickett, 2010; Ruiz-Casares, Trocme, & Fallon, 2012). It is defined as “when a parent or caretaker fails to provide the child with adequate protection from harmful people or situations” (Coohey, 2003a, p.149) and includes behaviors such as leaving a child home alone, leaving the child with an unsuitable caretaker, or not watching a child closely enough (Coohey, 2003a). These behaviors are concerning given their association with unintentional but serious physical injuries (Cerovac & Roberts, 2000; Landen, Bauer, & Kohn, 2003; Scott, Higgins, & Franklin, 2012), and adolescent delinquent and substance use behaviors (Snyder & Merritt, 2015, 2016).

Correlates of child neglect are well-articulated within a small but growing body of research. Studies have focused on a range of correlates, including parent or child characteristics, parent-child interactions, and family factors such as economic resources and hardship (Slack et al., 2011; Stith et al., 2009). Recent work done by Seay and Kohl (2015) suggests a plausible pathway from maternal alcohol and other drug dependence and depression to parent neglect behaviors to subsequent child behavior problems. Fewer studies have examined correlates of supervisory neglect specifically (e.g., Coohey, 2003b; Freisthler, Johnson-Motoyama, & Kepple, 2014; Freisthler, Wolf, & Johnson-Motoyama, 2015; Jonson-Reid et al., 2013) and have typically emphasized parent characteristics around motivation, capacity, or opportunity (Coohey, 1998, 2003b). For example, parent capacity to problem-solve or relate to others in ways that are essential for appropriate child supervision may be impaired by parent alcohol misuse or depression while conditions such as economic hardship or social support may be associated with resources available to provide appropriate supervision for a child (Freisthler et al., 2014).

Theory on child maltreatment etiology provides a useful starting place for conceptualizing relationships between antecedent risk factors such as parent alcohol misuse and economic hardship, intermediate risk factors, and supervisory neglect occurrence. Belsky (1984, 1993) applied Bronfenbrenner’s ecological systems theory (1979) to the problem of child abuse and proposed that maltreatment occurs within a context of factors at various levels of proximity to the child. Ecological systems theory uses the terms microsystem, mesosystem, and macrosystem to define these contexts. The microsystem includes the child’s immediate family; the mesosystem, the child’s surrounding community, and the macrosystem, the society within which the child lives. Each of these smaller systems is subsumed and influenced by the larger systems. Belsky (1984) expanded Bronfenbrenner’s work to better account for the interplay across and between contextual levels, including the effect of the parent’s own developmental process on parent-child interactions. Application of this work to child maltreatment research suggests that maladaptive parenting is likely a result of direct and indirect relationships between individual and social factors. Yet, only a small number of earlier studies have attempted to assess how these factors co-exist to create risk for supervisory neglect with no known studies assessing how key risk factors, such as parent alcohol misuse and economic hardship, indirectly increase risk for supervisory neglect behaviors. This study’s premise is simple: to begin deconstructing how parent alcohol misuse (defined by heavy drinking behaviors) or economic hardship directly or indirectly

produce risk for supervisory neglect. Fig. 1 shows the hypothesized relationships between these constructs that are subsequently discussed.

Potential Pathways to Supervisory Neglect

Building on the arguments made by Belsky's (1984), we submit that the presence of mediating factors may interrupt, and better explain, the pathway from more distal characteristics. The current study focused on the direct and indirect effects of two predominant correlates of supervisory neglect that can influence parents' capacity (e.g., alcohol misuse) and opportunity (e.g., economic hardship) to ensure adequate supervision of their children.

Alcohol Misuse to Supervisory Neglect

Parent alcohol misuse contributes to supervisory neglect because intoxication or other behaviors such as leaving home to purchase or drink alcohol may lead to failure to supervise children, failure to monitor their safety, or general lack of awareness around the child's health and well-being (see Fig. 1, Path B). A few studies have observed associations between parent alcohol misuse and supervision behaviors. For example, time spent with children was observed to be lower among parents with alcohol or other drug disorders compared to those not meeting criteria for alcohol or other drug disorders (Tartar, Blackson, Martin, Loeber, & Moss, 1993). Coohey (2008) observed positive bivariate relationships between inadequate supervision and alcohol or drug problems, clinical depression, cognitive disabilities, and problems with the law. In another study, parents reporting light drinking, moderate drinking, and occasional heavy drinking were associated with a higher likelihood of leaving a child home alone compared to non-drinkers; however, these effects were no longer significant when the model controlled for demographic characteristics, household income, perceived social support, and parenting stress (Freisthler et al., 2014). These earlier studies did not test parallel or indirect dynamics of relationships between these constructs and parental alcohol misuse.

It may be that correlates such as parental depression or social support may better explain the heterogeneity of behaviors observed across drinking behaviors, resulting in an indirect effect of alcohol misuse on supervision behaviors. For example, the behavioral effects of depression such as lethargy, hopelessness, and apathy may compound the effects of alcohol and influence the capacity for a parent to attend to their children (Coohey, 1998; see Paths A & F) and depression is highly prevalent among alcohol abusers (Fergusson, Boden, & Horwood, 2009), particularly women (Grant & Harford, 1995). The direction of relationship between alcohol misuse and depression is often debated in the literature. The self-medication hypothesis states that individuals with existing depressive symptoms use alcohol to relieve those symptoms and thus depression leads to increased alcohol misuse; however, the physiological mechanism of alcohol on brain chemistry suggests that a strict self-medication hypothesis is inaccurate (Kuhn, Swartzwelder, & Wilson, 2014). While some level of depressive symptoms may have instigated a drinking episode, drinking ultimately leads to greater depression. Supporting the physiological hypothesis that alcohol's depressive effects lead to depressed psychological symptoms (see Fig. 1, Path A), Fergusson et al. (2009) conducted a longitudinal study with a general community sample ($n = 1,055$) on

the direction of relationship between depression and alcohol abuse. The structural equation model with alcohol abuse predicting depression demonstrated a superior model fit, suggesting that depression is caused by alcohol abuse (Fergusson et al., 2009).

There is mixed evidence about whether low social support exacerbates depressive symptoms or depressive symptoms result in disengagement from or attrition of one's social support network (Cairney, Boyle, Offord, & Racine, 2003; Paykel, 2007). That being said, we suggest in this study that parental incapacities for supervision associated with alcohol misuse or depressive symptoms may be buffered by the presence of social supports providing substitute child care or additional monitoring and lowering the opportunities for supervisory neglect. Initial evidence supports this rationale with studies observing informal child care resources may be protective of supervisory neglect (Coohey, 2007; Freisthler et al., 2014), particularly for parents where alcohol misuse and associated depression may compromise functioning (Coohey, 2007). Another study observed almost 45% of Canadian child welfare cases indicating supervisory neglect were associated with few social supports (Ruiz-Casares et al., 2012). Fig. 1 shows a hypothesized relationship from depressive symptoms to low social support to supervisory neglect behaviors (Paths G & H).

Economic Hardship to Supervisory Neglect

Economic hardship has been identified as contributing to risk for neglect behaviors (Slack, Holl, McDaniel, Yoo, & Bolger, 2004; Slack et al., 2011). However, few earlier studies focus on income and supervisory neglect specifically. Of those that do exist, the relationship between economic hardship and supervisory neglect appears complex with the likelihood of economic hardship being protective of supervision problems (see Fig. 1, Path E). Within child welfare samples, supervision problems are associated with a lower percent of families identified as experiencing economic hardship compared to other forms of neglect but a higher proportion experiencing economic hardship compared to physical abuse or other maltreatment (Jonson-Reid et al., 2013; Ruiz-Casares et al., 2012). Findings from a general population study suggests a positive association between income level and leaving a child home alone (Freisthler et al., 2014), supporting earlier work that found mothers who worked outside the home were more likely to engage in multiple forms of supervisory neglect (Coohey, 2008).

Similar to our prior discussion of alcohol misuse, few earlier studies explore the mediating factors that might contextualize an association between poverty and neglect. Although economic hardship is associated with neglect, not all families in poverty neglect their children. An indirect pathway from income to supervisory neglect via depressive symptoms and social support may better explain this relationship. First, social support may provide families with informal resources that minimize opportunities for supervisory neglect (see Fig. 1, Path D). Resource-based supports can assist in daily survival of low-income families such as perceived economic hardship and actual material hardships (Henly, Danziger, & Offer, 2005) or provision of informal child care (Coohey, 2007). Henly et al. (2005) studied current and former welfare recipients and found that the lowest income families also were most likely to lack social support. Research finds that living in poverty contributes to depressive symptoms (Belle, 2003; Everson, Maty, Lynch, & Kaplan, 2002; Galea et al.,

2007) and is associated with longer durations of depressive episodes (Weich & Lewis, 1998). For example, Galea et al. (2007) conducted a population-based cohort study in New York City on the prevalence of depression in environments of urban poverty and observed a strong causal relationship between neighborhood-level socioeconomic status of residents and individual level depressive symptoms (see Fig. 1, Path C). Thus the relationship between income and supervision problems may be better explained through depressive symptoms and associated social support levels.

Parallel Pathways for Alcohol Misuse & Economic Hardship

In the general population, alcohol misuse is associated with individuals who have more income while alcohol dependence is associated with low socioeconomic status (Keyes & Hasin, 2008). Therefore general population studies on child maltreatment that may fail to shed light on this relationship as well, since alcohol misuse and low income are observed to be inversely related. To address this concern, we allowed the two constructs in our model to correlate without including a directional path. The prior review of the literature suggests the potential for unique and direct effects of alcohol misuse and income on supervisory neglect behaviors. In addition, both alcohol misuse and income may serve as distal factors that indirectly contribute to supervision problems through parent depressive symptoms and low social support (see Fig. 1).

Methods

Participants

Data were obtained from a telephone survey of 3,023 parents of children ages birth to 12 years living in California between March and October 2009. Purposive geographic sampling methods were used to select 50 mid-sized cities from the 138 incorporated cities in California with population size between 50,000 and 500,000; these procedures were developed to maximize validity with regards to geography and ecology of the state. Potential study participants were stratified by city and then randomly selected from a list-assisted sample obtained from a third party vendor, who had access to these data from sources that include credit bureaus, credit card companies, and other companies that maintain telephone lists. This approach allowed to better target households identified as having a child under the age of thirteen.

Prior to the phone calls, potential respondents were sent a pre-announcement letter with information about the study. After the pre-announcement letter, potential respondents were given the option to opt out of the survey by calling the toll-free number of the research firm. To reduce non-response bias, each phone number received 10 call attempts at different days and times if a live person was not reached. Participant selection criteria included being a parent or guardian of a child 12 years of age or younger living with them at least 50% of the time. When more than one eligible respondent resided in the household, a random selection procedure was used to choose one to be invited to participate in the survey. Exclusion criteria included individuals living in an institutional setting, who were not well enough to complete the interview, or did not speak either English or Spanish. Using this methodology, the response rate for the survey was 47.4% (Freisthler & Gruenewald, 2013).

Respondents gave verbal consent to participate. The survey took approximately 30 minutes to complete and participants were mailed a \$25 check for participation to an address they specified. The majority of survey questions were asked by a live interviewer using Computer Assisted Telephone Interviewing (CATI) methods. These questions addressed topics including demographic information, social support, mental health, parenting, alcohol and drug use, and neighborhood characteristics. Questions related to potentially reportable parenting behaviors were asked using interactive voice response (IVR) technology (Kepple, Freisthler, & Johnson-Motoyama, 2014). This technology allowed parents to report potentially abusive or neglectful practices through a series of computer-automated questions. Specific information related to respondent identity were masked prior to combining CATI responses to IVR responses, preventing researchers from having sufficient information to report any abusive or neglectful behaviors endorsed by a respondent.

Thirty-three cases were dropped prior to any statistical analysis due to invalid responses on questions regarding supervisory neglect where the respondent did not complete age-appropriate questions based on the date of birth they provided for their focal child. The analytic sample includes 2,990 respondents. Sample characteristics for these cases are provided in Table 1.

The current study is a secondary data analysis of this dataset specifically evaluating the relationship between parental heavy drinking frequency, family income, and supervisory neglect. Approval was obtained from the [blinded for review] Institutional Review Board prior to receipt of the dataset.

Measures

Endogenous dependent variable—Supervisory neglect was measured using a subset of supervision items from the Multidimensional Neglectful Behaviors Scale (MNBS), which was designed to capture a range of age-specific, potentially neglectful supervision behaviors (Kantor, Straus, Holt, Ricci, & Drach, 2003). For children 0 to 5 years, MNBS-Form PB includes six supervision items: (1) not monitoring child misbehavior; (2) failure to adequately supervise child; (3) leaving child in a location of unknown safety; (4) left child with an inadequate caregiver; (5) leaving child in a car alone; and (6) leaving child home alone. For age 5 to 9, six matched but age-appropriate items from the MNBS-Form PA were used. For focal children ages 10 to 12, five matched but age-appropriate items from the MNBS-Form PA were used. For this age group, “leaving child in a car alone” were set to missing because there was not a comparable question used for this survey. Respondents answered using a 4-point ordinal response set collapsed into three categories for the purposes of this study: 1 *Never*, 2 *Sometimes*, and 3 *Often or Always*. Cronbach’s alpha was calculated for these six items ($\alpha = .503$).

The six items were used to indicate the presence of a latent *supervisory neglect* construct given the low internal reliability, the missing data for certain age groups children, and the likely measurement error for self-reported parenting behaviors. A confirmatory factor analysis of this construct was estimated. Individual factor loadings were acceptable (see Fig. 2) except for the loading for “failure to monitor child misbehavior”, which fell below the recommended threshold of .3 (Little, 2013), likely because this item had a large proportion

of “not applicable/child does not get in trouble” responses for children ages 10 to 12 years. Because the item is included in the MNBS and therefore has theoretical significance, it was retained for the structural equation model analysis. Additionally, internal reliability was stronger with all six items. All factor loadings were statistically significant at a minimum probability level of $p < .05$.

Endogenous independent variables—Two questions from the Primary Care Evaluation of Mental Disorders were used to measure depressive symptoms (PRIME-MD; Spitzer, Kroenke, Williams, & the Patient Health Questionnaire Primary Care Study Group, 1999). Participants were asked to respond *No* or *Yes* to the whether they experienced loss of interest in activities and whether they experienced feelings of hopelessness. Cronbach’s alpha for these items was calculated ($\alpha = .641$). In order to study the effect of depressive symptoms, a latent factor was created. The two questions from the PRIME-MD comprised the *depressive symptoms* factor. A confirmatory factor analysis was estimated and individual loadings were fixed to equivalent for local identification. The factor loadings were acceptable at .875 and statistically significant at $p < .001$. Model fit statistics for this CFA were not available because perfect model fit was reported for the just identified construct.

Social support was measured using the Interpersonal Support Evaluation List short form (Cohen, Mermelstein, Kamarck, & Hoberman, 1985). Respondents answered 12 items measuring three types of social support (i.e., emotional support, tangible support, and social companionship). Response categories included a 4-point Likert-type scale ranging from 1 *Definitely False* to 4 *Definitely True*. Internal consistency was calculated with Cronbach’s alpha for each scale (Emotional support, $\alpha = .680$; Tangible support, $\alpha = .626$; Social companionship $\alpha = .668$). To measure low social support scores for each support type, responses to the component items were added up and then reverse coded, so that higher scores reflected lower levels of social support. The three reverse coded scale scores were used to create a latent construct measuring *low social support*. A confirmatory factor analysis was estimated using these three scores as indicators. Factor loadings for each indicator were acceptable (see Fig. 2) and statistically significant at $p < .001$.

Manifest independent variables

Parent Heavy Drinking Frequency: Drinking behaviors were obtained from parent self-reported frequency of drinking any alcoholic beverage and quantity of drinks in the last year. Parents responded to open-ended questions asking the number of days they consumed 1, 3, 6, and 9 drinks (*during the past month* for individuals who reported drinking at least monthly and *during the past year* for individuals who reported drinking less than monthly). The literature suggests that assessing drinking-related risks requires measurement of both drinking frequency and drinking volume (Sher, Wood, Wood, & Raskin, 1996; Widom, White, Czaja, & Marmorstein, 2007). Therefore, this study captured parental heavy drinking frequency using an annual frequency of heavy drinking (6+ drinks) variable that was estimated by multiplying monthly counts by 12 for monthly drinkers and self-reported annual counts for past year drinkers. To examine the validity of our decision to multiply the monthly heavy drinking variable by 12, we examined the correlation between participants’ reports of monthly heavy drinking (range 0–28; not multiplied by 12) to an item that asked

participants to report how often they drank in the last 12 months from a list of six categories ranging from (1) every day to (6) 2–3 times per month. The frequency of drinking variable was significantly correlated with the binge drinking variable in the expected direction ($r = -.296, p < .001$). That is, participants who reported more monthly drinking (lower scores on the frequency variable) also reported more instances of heavy drinking in the prior month, but not so frequently that the scores completely overlap which would inappropriately suggest that every time a participant reported drinking, they consumed 6+ drinks.

Low Income: The survey question asked respondents to place their household income in one of eight categories. Given the number of categories, this was treated as a continuous observed variable. To capture low income, the variable was reverse coded for the analysis. Table 2 presents descriptive information on each of the key exogenous and endogenous variables for the analysis sample.

Analytic Procedures

Statistical methods—Data were cleaned and bivariate analyses conducted in STATA Version 13.1 (StataCorp, 2013). In order to better understand the simple dynamics of variables in the structural model, bivariate analysis included correlations and one-way ANOVA for examining relationships between categorical and continuous variables.

Multivariate analyses were analyzed in MPlus Version 7 (Muthén & Muthén, 2012) using structural equation modeling (SEM). Consistent with current best practice in SEM, we used a bootstrapping approach to test the statistical significance of the indirect effects. Raw data (non-imputed) were used in order to conduct the bootstrapping procedure. Missing data were minimal: of model variables, income was missing data most frequently at 4% of the analytic sample. However, to improve the rigor of the analysis, SEM with bootstrapping was used in the final model to adjust standard errors for missing data (Enders, 2006).

Model identification was achieved using the fixed factor method. This put the latent variables on a standardized, z-score metric. Weighted Least Squares Means and Variances Adjusted (WLSMV) estimator was used for parameter estimation because of the presence of categorical data. Model fit was assessed using common indices including the Root Mean Squared Error of Approximation (RMSEA), Comparative Fit Index (CFI), and Tucker-Lewis Index (TLI). The following standards for acceptable model fit were used: RMSEA less than .10; CFI and TLI greater than .85; and factor loadings with values of .30 and above (Little, 2013). Conservative measures of good fit were also considered and are RMSEA less than .07 or .08 and CFI and TLI greater than .95 (Hooper, Coughlan, & Mullen, 2008; Bowen & Guo, 2012). We also report Weighted Root Mean Square Residual (WRMR), although a threshold of 1.0 is considered an experimental fit statistic according to the developers of Mplus (Muthén, 2012). Theoretical preference goes toward model parsimony and so the iterative estimation process at the structural model stage involved removing statistically insignificant or theoretically unnecessary regression paths and control variables.

Results

Bivariate Results

Prior to estimating the structural model, bivariate relationships between variables were examined. Heavy drinking was not significantly correlated with a mean score of the six supervisory neglect variable; however, means for supervisory neglect statistically significantly decreased from lowest to highest income category [$F(7) = 4.22, p < .001$], meaning that higher incomes were associated with lower supervisory neglect scores. To assess if drinking behaviors were differentially impacted by annual household income, we also conducted ANOVA to examine the association between means of heavy drinking across income categories. Annual frequency of heavy drinking (6+ drinks) was associated with income groups, although not in a linear pattern [$F(7) = .52, p < .001$]. The most reported heavy drinking was observed for respondents earning between \$40,001 and \$60,000 (mean = 2.422), followed by the lowest income group earning less than \$10,000 (mean = 2.354). The least frequent heavy drinkers were respondents earning between \$10,001 and \$20,000 (mean = .747). These results suggest that risk emanating from heavy drinking and low income status may operate distinctly, because although different income groups exhibited statistically significantly different frequencies of heavy drinking, a linear relationship between these two factors was not observed.

Multivariate Results

A three-factor CFA model was estimated to validate the items selected to measure each of the latent variables as described in the measures section above. Overall model fit for the fully specified measurement model was acceptable to good according to conservative criteria ($\chi^2(56, n = 2990) = 382.549, p < .001$, RMSEA (.040 – .048) = .044, TLI = .909, CFI = .935, WRMR = 1.846). The significant correlations between factors were all in the expected direction.

To begin, a fully specified structural model was estimated with directional paths connecting all constructs in the model. Model fit for the fully specified model was identical to the measurement model because no parameters were removed or added. Because SEM values parsimony, two paths that were statistically non-significant were pruned: the pathway from heavy drinking to low social support and from depressive symptoms to supervisory neglect. Fit statistics for the pruned model reflected acceptable model fit ($\chi^2(58, n = 2990) = 375.504, p < .001$, RMSEA (.039 – .047) = .043, TLI = .915, CFI = .936, WRMR = 1.872). The final step involved estimating the pruned structural model with bootstrapping to estimate direct and indirect effects (see Fig. 2). No statistical tool is available to evaluate the difference in model fit between the more complex structural models (parent models) and the more parsimonious (nested model) due to the fact that this analysis used the WLSMV estimator.

Fig. 2 presents the model with the standardized estimates of the path coefficients. The direct pathway from parent heavy drinking to supervisory neglect was not statistically significant ($\beta = .080, p = .137$). The pathway from parent heavy drinking to depressive symptoms ($\beta = .120, p = .001$) was significant. The pathways from depressive symptoms to low social

support ($\beta = .388, p < .001$), and from low social support to supervisory neglect ($\beta = .317, p < .001$) were statistically significant. Low income was directly associated with supervisory neglect ($\beta = .078, p = .016$) and was significant associated with increased depressive symptoms ($\beta = .120, p < .001$). Low income and parent heavy drinking were negatively correlated, although not to a level of statistical significance.

The standardized path coefficients roughly indicate the proportion of variance attributable to one standard deviation change on the independent exogenous or endogenous construct. For example, the pathway from low income to supervisory neglect suggests that a standard deviation (SD) reduction in income was associated with an 8% SD increase in supervisory neglect frequency. For example, regarding the path from low income to depressive symptoms, a SD reduction in income was associated with a 30% SD increase in the depressive symptoms latent construct. It should be noted that although these path coefficients are standardized and therefore comparable to one another in this way, the underlying scale and indicator standard error must be considered. To better understand the associated changes in the endogenous dependent variable based on the key exogenous variables, the total and indirect effects are presented in below.

Mediation Analysis: Parent heavy drinking, depressive symptoms, low social support, and supervisory neglect—We sought to examine the direct and indirect effects of parent heavy drinking on frequency of supervisory neglect. Table 3 presents estimates of the total and decomposition (i.e., direct and indirect) effects. The direct effect of parent heavy drinking on supervisory neglect ($\beta = .080$) was not significant. However, the indirect effects of parent heavy drinking on supervisory neglect revealed a significant effect. Parent heavy drinking was associated with supervisory neglect via depressive symptoms and low social support ($\beta = .015$). This suggests that parent heavy drinking increases supervisory neglect when depressive symptoms and low social support are present, but does not bear a direct effect on supervisory neglect frequency.

Mediation Analysis: Low income, depressive symptoms, low social support, and supervisory neglect—We simultaneously examined the parallel effect of low income on the outcome of interest through a similar pathway. The total effect of low income on supervisory neglect was statistically significant ($\beta = .174$). The direct effect of low income ($\beta = .078$) was larger than the indirect effect via depressive symptoms and low social support ($\beta = .037$), or the indirect effect via low social support alone ($\beta = .059$), indicating that the primary mechanism by which income contributes to supervision problems is through a direct effect. However, the total indirect effect was larger ($\beta = .096$) than the direct effect or specific indirect pathways, suggesting that the combined effects of low income, depressive symptoms, and low social support most substantially increase frequency of supervisory neglect.

Limitations

Some significant limitations to this study must be noted. First, the study used cross-sectional data to test direct and indirect associations, rather than causal processes. Second, the current study did not use post-hoc weights to adjust for non-response bias within the sampling

procedures. As a result, the findings are an exploration of theoretical relationships rather than generalizable phenomenon within mid-sized California cities. In addition, the use of a general population survey results in the majority of respondents being light to moderate drinkers. The lack of statistically significant ($p < .05$) direct effect of alcohol misuse on supervisory neglect may be due to the fact that heavier drinkers who would be more likely to engender harm to children were a small proportion of the sample. Third, our measures of alcohol misuse, income status, and depressive symptoms each presented some limitations. Based on the limitations of our dataset, we were only able to use one indicator of alcohol misuse which relied on self-reported frequency and volume of drinking. In addition, yearly counts had to be estimated for individuals reporting monthly since these individuals only reported frequency of 1, 3, 6, and 9 drinks for the past month. Diagnostic criteria for alcohol use disorders consider consequences of alcohol misuse. Our measurement of alcohol misuse would likely improve with indicators from a clinical measure. Additionally, the alcohol misuse and child neglect behavior items were not connected in terms of time proximity; that is, we did not ask parents to report how frequently they engaged in neglect behaviors while going to purchase alcohol, while actively drinking, or while recovering from the effects of drinking. It is possible that alternative, more time-specific measures of alcohol misuse would be better at capturing problematic drinking associated with supervisory neglect. Our measure of income was categorical and could have been strengthened by asking parents to provide an exact income figure. However, the fact that so many respondents provided income information albeit categorical is a clear strength of these data, since income data validity is frequently threatened due to missing data. Our measure of depressive symptoms was also limited because our dataset included only two indicators. All valid clinical assessments of depression ask more than two questions. That said, our depressive symptom questions came from a well-validated measure (Spitzer et al, 1999). Finally, while our model incorporated key risks for supervisory neglect identified in earlier literature we did not include variables associated with parent motivation, child demographics, or other contextual factors that may influence these relationships. More specifically, our current measures served as proxies for parent capabilities (i.e., alcohol misuse for plausible cognitive impairment) and parent opportunities (i.e., low income status for lack of material resources). Future studies would benefit from exploring these mechanisms with more refined measures to enhance our understanding of how parent capabilities and opportunities may mediate relationships between the variables identified in this study.

Discussion

Despite these limitations, this study has some strengths that warrant further discussion of its findings. In our study, the proportion of parents who reported engaging in supervisory neglect behaviors “sometimes” or “often/always” ranged from 14% who left their child somewhere unsafe to 19.6% who failed to monitor child misbehavior (Table 2). These figures are lower than earlier literature on supervisory neglect in child welfare involved (Mennen, Kim, Sang, & Trickett, 2010) and general population samples (Hussey, Chang, & Kotch, 2006), which show upwards of 40% of children being left home alone. Although leaving a child at home alone is both an age-dependent and culturally contextualized marker of supervision problems, suggesting that these studies may provide liberal prevalence

estimates, our study may under-estimate supervisory neglect frequency because our measure came from parent self-report. These findings contribute to the literature by providing conservative, self-report-based estimates on prevalence and frequency of six key supervisory neglect behaviors in a general population sample. The results of our bivariate analyses also illuminate some intricacies of the relationship between parent heavy drinking, income level, and specific supervisory neglect behaviors. To briefly summarize these relationships, we observed a linear association between income and supervision behaviors, with more frequent supervisory neglect at lower incomes. We observed a non-significant, negative association between parent heavy drinking and supervisory neglect. And we found a non-linear, statistically significant association between parent heavy drinking and income. Together, these findings predict what we observed with our multivariate analysis: that low income directly predisposes families to increased supervisory neglect behaviors; that the effect of parent heavy drinking depends on the presence of mediator variables; and that low income and parent heavy drinking increase risk of supervisory neglect via distinct pathways. In further discussion of the bivariate findings, correlation analysis between parent heavy drinking and supervisory neglect scores revealed a non-significant, negative association. Although we observed a statistically significant indirect effect via depressive symptoms and low social support, no direct relationship between parent heavy drinking and supervision problems was observed (Fig. 2). It is possible that heavily drinking parents feel concern about their child's behavior, perhaps even more than higher-engaged, lower drinking parents. In the presence of depressive symptoms, however, concern for the child may be diminished resulting in general social withdrawal and subsequent increased risk of supervision problems. An earlier study using these data (Freisthler et al., 2014) found that the association between drinking severity and likelihood of supervisory neglect behaviors disappeared when multivariate, multilevel controls were added into their modeling. However, this earlier study examined individual supervisory neglect behaviors and no one neglectful behavior constitutes global supervisory neglect. Using the six items from the MNBS to create a *supervisory neglect* latent construct allowed us to more rigorously estimate the association between predictor variables and the theoretical outcome variable that accounts for overlap between these specific neglect indicators.

For the income levels, we observed that a mean score of the six neglect items was statistically significantly different across income levels and trended in a linear pattern from most neglect at the lowest income category, to the least neglect in the higher income categories. The bivariate relationship between income levels and drinking behaviors was examined as well. Some prior literature on this association suggests that lower income families may drink less due to the burden of purchasing alcohol (Keyes & Hasin, 2008; Grant, 1997; Hasin, Stinson, Ogburn, & Grant, 2007). The heavy drinking variable was statistically significant across income groups, although not in a linear pattern, with the means suggesting that the lowest income category did more frequent heavy drinking compared to the second and third lowest income groups. Although these figures suggest that an interaction between heavy drinking and income may exist, whereby the combination of heavy drinking and low incomes represents a particular risk typology, a *post hoc* moderation analysis revealed no statistically significant effect (results not reported). This may be because the number of respondents in the lowest income group was relatively small (3% of

the sample), as was the overall frequency of parent heavy drinking. Future studies that oversample low income and heavy drinkers are needed to test for this possible interaction.

Earlier studies focusing on risk accumulation in maltreatment likelihood have accounted for both parental substance use and economic hardship (MacKenzie, Kotch, & Lee, 2011), but we found no earlier studies that have examined the direct and indirect effects of alcohol misuse and low income on risk for supervisory neglect. The results of our structural equation model highlight that parental alcohol misuse and family income both serve as risk factors for supervisory neglect but may contribute to these behaviors through different pathways. The negative correlation between the two variables indicated that lower income is associated with greater alcohol misuse in our sample, although the association did not reach statistical significance. This contributes to the already mixed research findings on the relationship between alcohol misuse and income, with some studies observing an inverse relationship between the two constructs (Keyes & Hasin, 2008). This is meaningful because we know from earlier studies that both alcohol misuse and poverty may be risk factors for supervisory neglect (Coohey, 2008; Slack et al., 2004; Slack et al., 2011), that for some families these risk factors co-occur (Rosen, Spencer, Tolman, Williams, & Jackson, 2003), and yet in the general population, there is a trend for these risks to inflate in opposite (and therefore mutually exclusive) directions (Keyes & Hasin, 2008). This means that from a risk for supervisory neglect standpoint, many families experience *either* severe alcohol misuse *or* low family income. It must be noted that although we observed a negative correlation between parent heavy drinking and income, the value of that correlation was small ($\Psi = -.055$). As described in the bivariate results section, within our sample, individuals who reported more heavy drinking were most likely to be low-middle income (\$40,001–\$60,000) or very low income (<\$10,000). Given the association in this study and earlier literature between low income and depressive symptoms, alcohol misuse and depressive symptoms, and the significant pathway from depressive symptoms to supervision problems via low social support, this suggests that the most materially disadvantaged children may be at higher risk when their parents drink heavily. Children in lower income families face risk associated with parental alcohol misuse at times in addition to risk associated with low-income status. For many families, though, alcohol misuse increased as income increased.

Further implications emerge when we examine the mechanisms that associate each risk factor with supervisory neglect. Although both parent heavy drinking and income were included in the same model (see Fig. 2), we will discuss these pathways separately because each performed differently in the model. In our study we found that parent heavy drinking was only indirectly associated with supervisory neglect behaviors while low income was directly associated with the same behaviors. When considering the inverse correlation between parent heavy drinking and income, these findings imply that the mechanism by which supervisory neglect occurs for families with more frequent alcohol misuse may be distinct from that of low-income families. Whereas more frequent heavy drinking was indirectly associated with parents reporting more supervisory neglect behaviors in the presence of depressive symptoms, a finding consistent with earlier literature (Coohey, 2008), low income was directly associated with supervisory neglect. Jonson-Reid, Drake, and Zhou (2013) observed in a sample of 6,818 Black and White children that supervisory neglect, compared to other forms of neglect, were associated with slightly lower rates of family and

community poverty. This study also examined the presence of other risk factors among neglect subtypes, including parent factors such as social isolation and treated or untreated parent mental health or substance abuse problems. Jonson-Reid et al. found that children with supervisory neglect had fewer parenting risks and caregiver mental health/substance abuse problems compared to children with basic neglect (lack of food, shelter, and clothing). This prior study did not distinguish the effect of alcohol misuse nor estimate the association of these effects in a path model. This is a limitation given that certain factors are theoretically antecedent to others.

Our findings suggest that low income engenders direct risk for supervisory neglect. Additionally, depressive symptoms in our model were associated with low social support, and therefore low income-status raised risk of supervisory neglect by increasing depressive symptoms as well. As noted in our literature review, this finding is consistent with prior research which finds that poverty is associated with increased parent depressive symptoms (Belle, 2003; Everson, Maty, Lynch, & Kaplan, 2002; Galea et al., 2007). Our findings suggest that children in families with alcohol misuse are placed at risk by alcohol's effect on depressive symptoms and resultant effects on social support, and children in low income families are at risk due to caregiver depressive symptoms and lack of social support. For children in families with both alcohol misuse and low income, our findings suggest that risk occurs directly and indirectly. We could find no earlier studies with a general population sample that examined the concurrent effects of alcohol misuse and low income on supervisory neglect. Future studies are needed to corroborate our findings using longitudinal data. Additionally, future research should seek to examine high-risk sub-groups such as heavy drinkers and very low income families.

Deeper significance of our findings materialize when we compare the results of this study to earlier work on parental alcohol misuse and poverty among families who secure child maltreatment intervention via child protective services (CPS). One key strength of the current study is that the sample is a community-based sample and therefore provides a picture of social mechanisms related to supervisory neglect that may or may not reflect the same social mechanisms that predict CPS-involvement. Epidemiological research indicates that rates of maltreatment are substantially higher than official reports. For example, Theodore et al. (2005) conducted anonymous telephone surveys in the Carolinas and found that child abuse rates were 40 times those reported to child protective services. While understanding actual prevalence is a critical task of community-based child maltreatment research, it is also critical to identifying risk factors for maltreatment. The gaps between community-based research and CWS-based research on child maltreatment point to opportunities for further research and, possibly, for intervention. In this instance, our study found that alcohol misuse and income were inversely correlated *and* each contributed to risk for supervisory neglect in different but related ways. Among children placed into foster care by CPS nationally, alcohol abuse is a reason for removal in 9.2% of cases across states that reported (U.S. Department of Health and Human Services, 2016), which roughly reflects the prevalence of alcohol use disorders in the general population (Substance Abuse and Mental Health Services Administration, 2014). These findings dilute the considerable range among states' individual reporting. In Nebraska, only 1.1% of children are in foster care due to

caregiver alcohol abuse. In New Mexico, over 37% of children are in foster care due to caregiver alcohol abuse.

Compared to alcohol misuse, low-income status is more common among the child welfare-involved population and nationally. Barth, Wildfire, and Green (2006) found that 49% of caregivers with a child placed into foster care reported struggling to pay for basic needs. The national poverty rate in 2006 was 12.3% and in 2014 was 14.8% (DeNavas-Walt & Proctor, 2015). Among female-headed households, those rates are higher at 30.5% in 2006 and 33.1% in 2014 (DeNavas-Walt & Proctor, 2015), but are still much lower than what is present in the child welfare system (Barth et al., 2006). In our sample, 21% of families reported less than \$40,000 annually. Nine percent reported less than \$20,000. Of relevance to this discussion, our study observed that the indirect effect of alcohol misuse on risk for maltreatment was stronger than the direct effect of income status. This suggests two things: (1) children experiencing supervisory neglect due to caregiver alcohol misuse may be under-represented among families experiencing CPS intervention, particularly in certain states, and (2) children from low-income families may be over-represented in the CPS-system. A robust body of literature has debated the over- or under-representation of low income families in CPS (Drake & Jonson-Reid, 2014). Less well known is the extent to which income is associated with supervisory neglect in the general population, which, as indicated in this study, it is. These findings suggest that the prevalence of low income families receiving CPS services is due to both other risk factors that co-occur with low income status as well as a direct result of income.

The relationship between poverty and supervision problems is further complicated by the fact that low-income families are often headed by single mothers who must work full-time in order to survive. Without a second caregiver and with limited means to pay for childcare, children may be more likely to be unsupervised. It goes without saying that leaving a very young child unattended presents a grave risk to safety, but less clear is whether leaving a school-aged child alone is an act of child maltreatment or a less than ideal fact of poverty. The purpose of this analysis is not to debate the nature of neglect versus poverty, nor to critique earlier definitions of supervisory neglect. Rather, we wish to consider our findings in light of the roles that culture and economic position play in characterizing certain parenting behaviors as supervisory neglect. In our study, we found that income was directly associated with reported frequency of supervisory neglect and was indirectly associated through depressive symptoms and low social support. It may be that lower-income parents who have greater psychological and social resources are able to compensate for the tendency to lack adequate means for child supervision and are less likely to engage in supervisory neglect behaviors. Future research should examine whether the lowest income families are able to avoid poor supervision through mental health and social resource utilization.

From a practice standpoint, for families with co-occurring risks of alcohol misuse and low income status, prevention interventions appear to differ for each risk factor. Families with more frequent parental alcohol misuse are at indirect risk of supervisory neglect, suggesting that the appropriate course of intervention entails treating depressive symptoms and improving social support. For families with low incomes, the effect on supervisory neglect risk is direct, meaning that reducing risk involves increasing income as well as addressing

depressive symptoms and social support. Intervening with mental health or community-building interventions may disrupt the indirect pathway that leads to supervisory neglect. Future longitudinal research is needed to shed light on the dynamics that shape the relationships between income, depressive symptoms, social support level, and supervisory neglect.

Considering that these data come from a community-based sample, our findings suggest potential pathways for prevention (before families engage the child welfare system) that build on a recent CDC report emphasizing the need to provide economic supports, address social supports such as quality care options, and intervene earlier to lessen harms from risks such as parent alcohol misuse and depression (Fortson et al., 2016). Findings from this study suggest providing economic supports alone may not be sufficient in preventing supervision problems if other factors such as depression and social isolation are not addressed. In addition, universally screening and targeting parent alcohol misuse through SBIRT practice may help minimize escalation of alcohol misuse behaviors and residually improve mental health symptoms, thus decreasing risk for supervision problems (Madras, Compton, Avula, Stegbauer, Stein, & Clark, 2009). Future studies should assess these relationships over time to see how temporal ordering may influence observed relationships. In addition, these relationships may look different among child welfare system-involved parents, who are more likely to be people of color, young parents, single parents, and low-income compared to this study's sample (Kim, Chenot, & Ji, 2011). Finally, these findings build upon the prior literature predominantly focused on extreme behaviors or circumstances (e.g., severe substance use disorders or extreme poverty) to understand how a range of alcohol misuse and income levels may be directly and/or indirectly associated with supervisory neglect outcomes. Future studies would benefit from longitudinal modelling of how these factors work together in ways that suggest the makings of the "perfect storm" for parent supervision problems.

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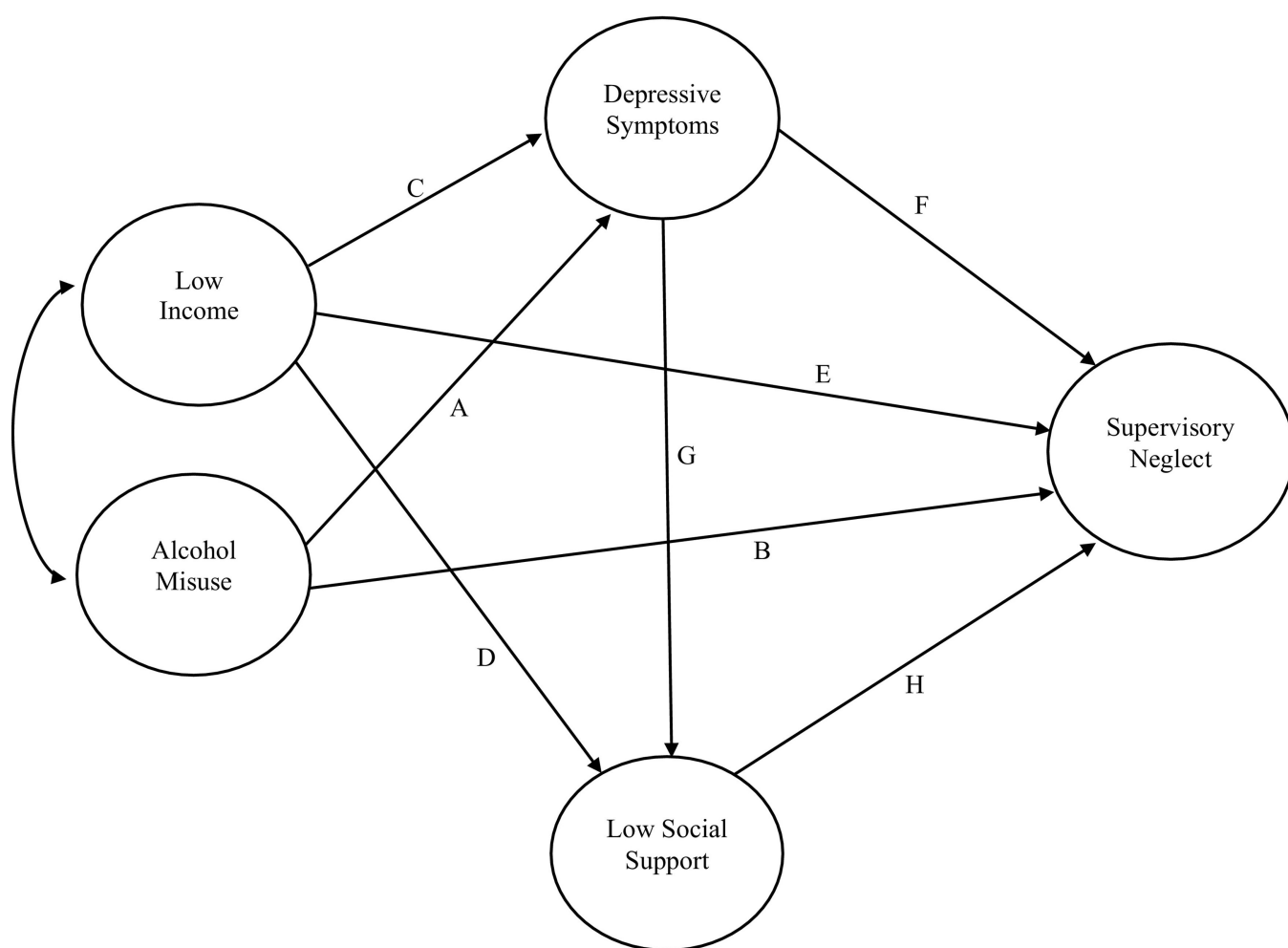


Fig. 1.
Hypothesized Model.

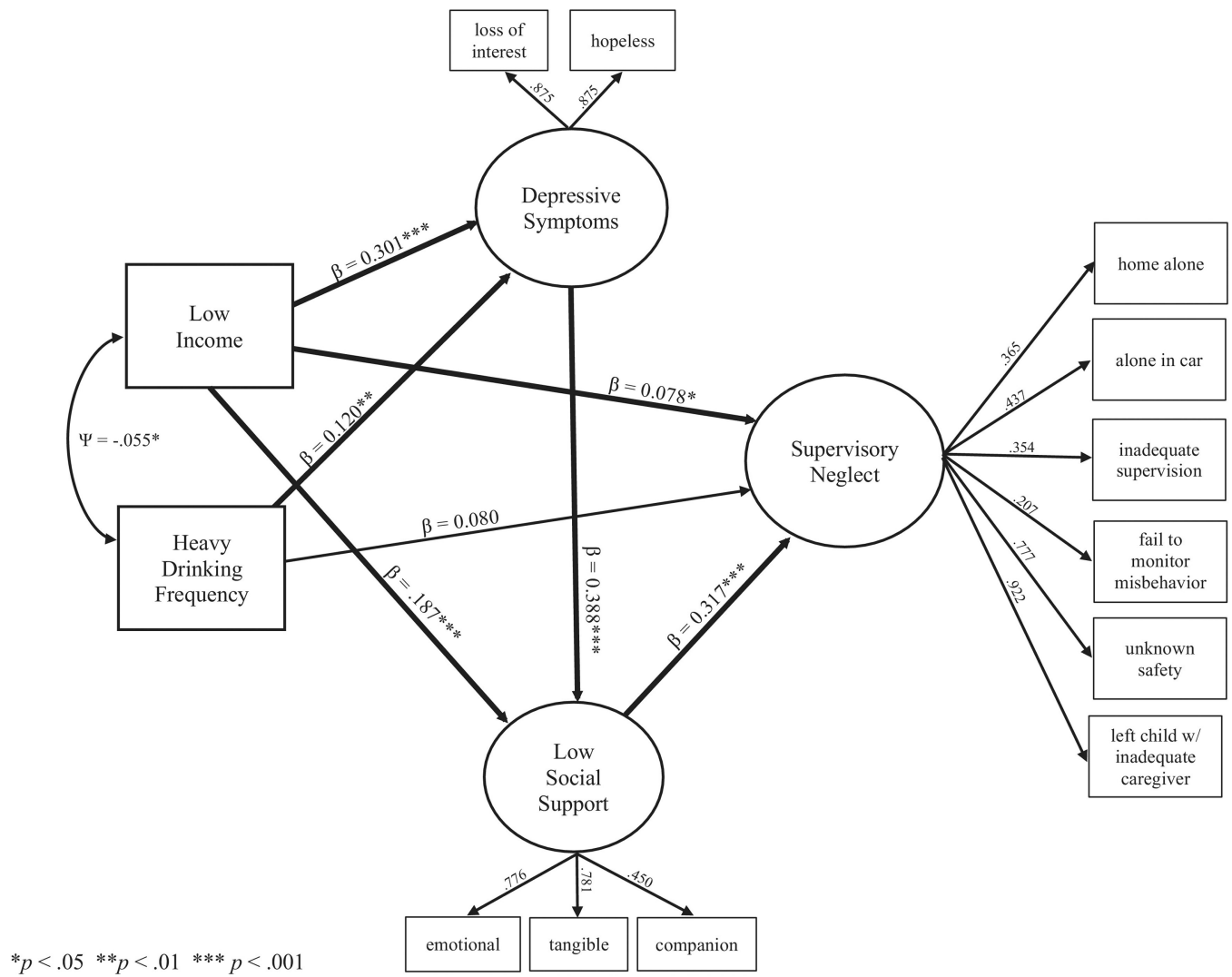


Fig. 2.
Structural Equation Model.

Table 1

Sample Descriptive Statistics (n = 2,990)

Variable	n	Mean (SD) or %
Sex (female)		
Parent (female)	1952	65.3
Child (female)	1437	48.1
Race/Ethnicity		
Caucasian	1744	58.3
Black	110	3.7
Hispanic	717	24.0
Asian	232	7.8
Other Race	82	2.7
Age		
Parent	2990	39.1 (7.8)
Child	2914	6.7 (3.6)
Marital Status		
Married/Cohabit	2647	88.5
# of Children	2990	2.3 (1.0)
Income Category		
Less than \$10,000	83	2.9
\$10,001 to \$20,000	168	5.8
\$20,001 to \$40,000	352	12.2
\$40,001 to \$60,000	366	12.7
\$60,001 to \$80,000	447	15.5
\$80,001 to \$100,000	410	14.3
\$100,001 to \$150,000	645	22.4
More than \$150,000	405	14.1

Table 2

Descriptive Characteristics on Model Indicators

	n	%	Mean (SD)
Alcohol Use Severity			
Annual Heavy Drinking (6+ Drinks)	2970		1.6 (13.6)
Socioeconomic status			
Income (Scale 1–8)	2876		5.6 (1.8)
Low social support (Scale 4–16)			
Emotional support score	2963		15.0 (1.8)
Tangible support score	2962		14.6 (1.9)
Companionship score	2961		12.1 (1.5)
Depressive symptoms			
Loss of interest			
Yes	291	9.9	
No	2664	90.2	
Hopeless			
Yes	386	12.9	
No	2597	87.0	
Supervisory Neglect			
Left alone in car ^a			
Never	2046	90.5	
Sometimes	165	7.3	
Often or Always	49	2.2	
Left where not safe			
Never	2451	86.0	
Sometimes	163	5.7	
Often or Always	235	8.3	
Left child with inadequate caregiver			
Never	2712	95.9	
Sometimes	42	1.5	
Often or Always	75	2.7	
Fail to adequately supervise child			
Never	2567	86.4	
Sometimes	243	8.2	
Often or Always	161	5.4	
Fail to monitor child misbehavior ^b			
Never	2190	80.4	
Sometimes	335	12.3	
Often or Always	199	7.3	
Child home alone			
Never	2357	83.1	
Sometimes	362	12.8	

	n	%	Mean (SD)
Often or Always	119	4.2	

^aThis question did not apply to children ages 10 to 12 years.

^bRespondents were allowed to respond *Not Applicable* for ages 10 to 12.

Table 3

Standardized Direct and Indirect Effects

	Coefficient
Alcohol use on supervisory neglect	
Direct	.080
Total direct and indirect	.095
Total indirect	.015 **
By depressive symptoms and low social support	.015 **
Low income on supervisory neglect	
Direct	.078 *
Total direct and indirect	.174 ***
Total indirect	.096 ***
By depressive symptoms and low social support	.037 ***
By low social support	.059 ***

*
 $p < .05$

**
 $p < .01$

 $p < .001$